REMARKS

The present invention provides novel lithium mixed-metal materials that are useful in rechargeable lithium batteries. These materials have the nominal formula $LiMI_{1-y}MII_yPO_4$, wherein MI is at least one transition metal from Groups 4 through 11 of the Periodic Table; MII is at least one element selected from Groups 2, 12 and 14 of the Periodic Table; and $0 < y < 1$.

The Examiner previously allowed Claims 56 - 79, 83 - 86, 96 - 107 and 121 - 134. For the Examiner's convenience, a copy of the Notice of Allowance dated May 18, 2002 is attached hereto. Applicants have cancelled these previously allowed claims, without prejudice. Upon entry of this Preliminary Amendment, these previously allowed claims will be replaced with new, narrower Claims 135 - 176. Support for these claims is found in the specification as filed.

The table below shows the general correspondence of the new independent claims presented in this Preliminary Amendment in relation to the previously allowed claims (although the specific claim language and scope has been changed). The amendments presented in this Preliminary Amendment have been made in order to better focus on various embodiments which are among those preferred by Applicants.

New Independent Claim	Corresponding Claim as Allowed (Now cancelled in this amendment)
135	56
153	83
154	84
155	85
156	86
157	96
166	121

Applicants respectfully submit that that the claimed invention is novel and not obvious, and that the Application, as amended, is in a prima facie condition for allowance. Applicants new claims are directed to a class of compounds (as well as electrodes and batteries employing the same) represented by the nominal formula $LiFe_{1-y}M_yPO_4$, wherein M is selected from the group consisting of Be, Mg, Ca, Sr, Ba, and mixtures thereof; and $0 < y < 1$. These new claims are narrower in scope than those claims previously deemed allowable by the Examiner.

Accordingly, Applicants respectfully request, upon consideration of the new claims presented in this Preliminary Amendment, allowance of all claims.

In addition, Applicants have submitted herewith copies of two Information Disclosure Statements previously submitted by Applicants, through Applicants' counsel, on September 7, 2001 and June October 11, 2001. These Information Disclosure Statements are being provided because it is not clear from the record, at this time, whether these Information Disclosure Statements were formally entered. Applicants respectfully request that these Information Disclosure Statements be considered and made of record in the present Application.

Finally, in accordance with the Notice of Draftsperson's Patent Drawing Review (PTO-948) dated May 20, 2002, Applicant herewith has submitted twenty-two (22) sheets of formal drawings. No new matter has been added to the new formal drawings. Applicants respectfully submit that all figures comply with 37 CFR 1.84(c) and (g).

Should anything further be required, the Examiner is respectfully requested to telephone the undersigned at 702-558-1000 (x1071).

Respectfully submitted,

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MARKED-UP VERSION OF CLAIMS

135. (New) A compound represented by the nominal formula:

$$LiFe_{1-y}M_yPO_4,$$

wherein M is selected from the group consisting of Be, Mg, Ca, Sr, Ba, and mixtures thereof; and $0 < y < 1$.

136. (New) A compound of Claim 135, wherein $0 < y \leq 0.5$.

137. (New) A compound of Claim 136, wherein $0 < y \leq 0.2$.

138. (New) A compound of Claim 137, wherein $0 < y \leq 0.1$.

139. (New) A compound of Claim 135, wherein M is selected from the group consisting of Mg, Ca, Ba, and mixtures thereof.

140. (New) A compound of Claim 139, wherein M is a mixture of metals selected from the group consisting of Mg, Ca, and Ba.

141. (New) A compound of Claim 140, wherein M is Mg.

142. (New) A compound of Claim 141, wherein said compound is represented by the nominal formula $LiFe_{1-y}Mg_yPO_4$; and $0 < y \leq 0.5$.

143. (New) A compound of Claim 142, wherein $0.2 \leq y \leq 0.5$.

144. (New) A compound of Claim 143, wherein said compound is represented by the nominal formula $LiFe_{0.8}Mg_{0.2}PO_4$.

145. (New) A compound of Claim 141 wherein $0.1 < y < 0.2$.

146. (New) A compound of Claim 141, wherein $0 < y \leq 0.1$.

147. (New) A compound of Claim 146 having the nominal formula $LiFe_{0.9}Mg_{0.1}PO_4$.

148. (New) A compound of Claim 140, wherein M is Ca.

149. (New) A compound of Claim 148 having the nominal formula $LiFe_{1-y}Ca_yPO_4$, wherein $0 < y \leq 0.2$.

150. (New) A compound of Claim 149 having the nominal formula $LiFe_{0.9}Ca_{0.1}PO_4$.

151. (New) A compound of Claim 149 having the nominal formula $LiFe_{0.8}Ca_{0.2}PO_4$.

152. (New) A compound of Claim 135 which has an olivine structure.

153. (New) An electrode comprising a compound of Claim 135.

154. (New) An electrode comprising a compound of Claim 139.

155. (New) An electrode comprising a compound of Claim 144.

156. (New) An electrode comprising a compound of Claim 147.

157. (New) An electrode, comprising:

(a) a binder;

(b) an electrically conductive carbonaceous material; and

(c) an active material having the nominal formula $LiFe_{1-y}M_yPO_4$, wherein M is selected from the group consisting of Be, Mg, Ca, Sr, Ba, and mixtures thereof; and $0 < y < 1$.

158. (New) An electrode of Claim 157, wherein $0 < y \leq 0.2$.

159. (New) An electrode of Claim 158, wherein said active material has the nominal formula $LiFe_{1-y}Mg_yPO_4$.

160. (New) An electrode of Claim 159, wherein said active material has the nominal formula $LiFe_{0.9}Mg_{0.1}PO_4$.

161. (New) An electrode of Claim 159, wherein said active material has the nominal formula $LiFe_{0.8}Mg_{0.2}PO_4$.

162. (New) An electrode of Claim 157, wherein said active material is a single phase compound having the nominal formula $LiFe_{1-y}Ca_yPO_4$.

163. (New) An electrode of Claim 162, wherein said active material has the nominal formula $LiFe_{0.9}Ca_{0.1}PO_4$.

164. (New) An electrode of Claim 162, wherein said active material has the nominal formula $LiFe_{0.8}Ca_{0.2}PO_4$.

165. (New) An electrode of Claim 157, wherein said active material has an olivine structure.

166. (New) A lithium battery, comprising:

(a) a first electrode comprising an active material represented by the nominal formula $LiFe_{1-y}M_yPO_4$, wherein M is selected from the group consisting of Be, Mg, Ca, Sr, Ba, and mixtures thereof; and $0 < y < 1$;

(b) a second electrode which is a counter-electrode to said first electrode; and

(c) an electrolyte between said electrodes.

167. (New) A lithium battery of Claim 166, wherein said first electrode is a cathode, and said second electrode is an insertion anode.

168. (New) A lithium battery of Claim 167, wherein said second electrode comprises a metal oxide, metal chalcogenide, carbon, graphite, or a mixture thereof.

169. (New) A lithium battery of Claim 166, wherein $0 < y \leq 0.2$.

170. (New) A lithium battery of Claim 169, wherein said active material has the nominal formula $LiFe_{1-y}Mg_yPO_4$.

171. (New) A lithium battery of Claim 170, wherein said active material has the nominal formula $LiFe_{0.9}Mg_{0.1}PO_4$.

172. (New) A lithium battery of Claim 170, wherein said active material has the nominal formula $LiFe_{0.8}Mg_{0.2}PO_4$.

173. (New) A lithium battery of Claim 169, wherein said active material is a single phase compound having the nominal formula $LiFe_{1-y}Ca_yPO_4$.

174. (New) A lithium battery of Claim 173, wherein said active material has the nominal formula $LiFe_{0.9}Ca_{0.1}PO_4$.

175. (New) A lithium battery of Claim 173, wherein said active material has the nominal formula $LiFe_{0.8}Ca_{0.2}PO_4$.

176. (New) A lithium battery of Claim 166, wherein said active material has an olivine structure.